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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,920	04/22/2005	Rainer Richter	016906-0365	4566
23428 7590 07/09/2008 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			EXAMINER BELL, CHARLES NEWTON	
			ART UNIT 4116	PAPER NUMBER
			NOTIFICATION DATE 07/09/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

# Office Action Summary

**Application No.**

10/522,920

**Applicant(s)**

RICHTER ET AL.

**Examiner**

CHARLES BELL

**Art Unit**

4116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 01/31/2005
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. In response to the Preliminary Amendment filed on January 31, 2005, claims 1-11 are amended and remain pending.

***Claim Objections***

2. Claim 1 objected to because of the following informalities: The flat tubes are designated as (2, 3), and the corrugated ribs are designated as (1) in line 3. The corrugated rib is designated as (2) in line 5, which renders the claim unclear. For the purpose of this examination, the examiner has used the designation of (1) for the corrugated ribs. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 9 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim

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does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 9 recites the broad recitation "rib depth RT in the range of 10 to 70 mm", and the claim also recites "preferably 12 to 20 mm or 40 to 64 mm" which is the narrower statement of the range/limitation. Additionally, claim 11 recites the broad recitation "rib height RH in a range of 3 to 15 mm", and the claim also recites "preferably 6 to 10 mm" which is the narrower statement of the range/limitation.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Wölk (U. S. Pat. No. 7,147,047 B2.)

In regard to claims 1 and 2, Figs. 1a and 1b of Wölk disclose a heat exchanger, with a soldered (see col. 4, ln. 31) heat exchanger network consisting of flat tubes (2) and of corrugated ribs (3), a liquid and/or gaseous medium being capable of flow through the flat tubes and air being capable of flow around the corrugated ribs, (see col. 4, ln. 16 and 17, and ln. 33 and 34), a corrugated rib (3) having in each case two rib surfaces (4b) which are arranged essentially parallel to one another (see col. 4, ln. 32 and 33), and which are connected in each case by means of an arcuate piece (4a) soldered to a flat tube, characterized in that the arcuate piece has a lower curvature in a middle portion than in a first outer portion and in a second outer portion, (see col. 4, ln. 26-28), (as per claim 1); a heat exchanger in that the rib surfaces are equipped with gills (7, and see col. 4, ln. 42), (as per claim 2.)

In regard to claims 3-6, Figs. 1a and 1b of Wölk disclose a heat exchanger with the radius of curvature of the arcuate piece greater than the rib height, (as per claim 3), with the arcuate piece having in the first outer portion a radius of curvature which is lower than half a rib height of the corrugated rib (as per claim 4), the arcuate piece having in the second outer portion a radius of curvature which is greater than or equal to a radius of curvature in the first outer portion, (as per claim 5), the arcuate piece having in the second outer portion a radius of

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curvature which is lower than a rib height of the corrugated rib, (as per claim 6), (see col. 4, ln. 26-29).

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wölk, as applied to claim 1 above, in view of Kuroyanagi et al., (U. S. Pat. No. 6,308,527 B1).

It is noted that Wölk does not specifically disclose the heat exchanger characterized in that the corrugated rib has a rib division in the range of 1 to 3 mm.

However, Fig. 6B of Kuroyanagi et al. teaches the corrugated rib has a rib division (fp), in the range of 1 to 3 mm., (see col. 8., ln. 18.) Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Wölk with the rib division of Kuroyanagi et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

11. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wölk, as applied to claim 1 above, in view of Shimoya et al. (U. S. Pat. No. 7,231,965 B2).

In regard to claim 9, it is noted that Wölk does not specifically disclose the heat exchanger characterized in that the corrugated rib has a rib depth in the range of 10 to 70 mm.

However, Fig. 16 of Shimoya et al. teaches the corrugated rib has a rib depth (B, and see col. 5, ln. 57-59) in the range of 10 to 70 mm. Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Wölk with the rib depth of Shimoya et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

In regard to claim 11, it is noted that Wölk does not specifically disclose the heat exchanger characterized in that corrugated rib has a rib height in a range of 3 to 15 mm.

However, Fig. 19 of Shimoya et al. teaches the corrugated rib has a rib height (C) in a range of 3 to 15 mm. (see col. 15, ln 65-67, and col. 16, ln. 1-3, and 21-32). Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine

the apparatus of Wölk with the rib height of Shimoya et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wölk in view of Shimoya et al., and further in view of Hu et al., (U. S. Pat. No. 6,805,193 B2).

It is noted that Wölk does not specifically disclose the heat exchanger characterized in that the gills have a gill depth in a range of 0.5 to 1.5 mm and a gill angle in the range of 20 degree to 35 degree.

However, Fig. 7 of Shimoya et al. further discloses a gill depth (P) in a range of 0.5 to 1.5 mm, (see col.13, ln. 22-26); and Fig. 7 of Hu et al. discloses a gill angle in the range of 20 degree to 35 degree (see col. 2, ln. 54-58). Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Wölk with the gill depth of Shimoya et al. and the gill angle of Hu et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wölk, in view of Kuroyanagi et al., and further in view of Shimoya et al.

It is noted that Wölk does not specifically disclose the heat exchanger characterized in that the ratio of gill depth LP to rib division FP is in a range of 0.385 to 0.825. It is also noted that not all of the ranges of LP and FP of the invention fall into a ratio range of 0.385 to 0.825.



However, Fig. 6B of Kuroyanagi et al. teaches a rib division of 2.6 mm, and Fig. 7 of Shimoya et al. teaches a gill depth of 0.75 mm resulting in a gill depth to rib division ratio of 0.288. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHARLES BELL whose telephone number is (571)270-5538. The examiner can normally be reached on 7:00AM - 4:30PM EST Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joe Cheng can be reached on (571)272-4433. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/C. B./

Examiner, Art Unit 4116

/Barbara L. Gilliam/

Supervisory Patent Examiner, Art Unit 4128